

CARIBE WAVE 2013

Webinar 1 English

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Institutional Reference Frame for the Exercise

- The United National Educational, Scientific, and Cultural Organization's (UNESCO) Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (**ICG/CARIBE EWS**)
- Caribbean Disaster and Emergency Management Agency (**CDEMA**)
- Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (**CEPRENAC**)
- The US NWS National Tsunami Hazard Mitigation Program (**NTHMP**) y Caribbean Tsunami Warning Program (**CTWP**)

CARIBE WAVE 2011

- 34 countries and territories* participated in the first regional tsunami exercise, CARIBE WAVE 2011 which was held on March 23, 2011. This represented a participation rate of almost 90% of the nations in the region that have nominated Tsunami Warning Focal Points and National Contacts in the region and 75% of all the countries and territories in the region.

* Aruba, Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Colombia, Dominica, Dominican Republic, France (Martinique, Guadeloupe, St Martin), Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Netherlands (Curacao, Sint Maarten and Sint Eustatius), Nicaragua, Panama, Peru, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, United Kingdom (Anguilla, British Virgin Islands, Bermuda, Cayman Islands, Turks and Caicos), United States (Puerto Rico and the US Virgin Islands).

Lessons from CARIBE WAVE 2011

- Confusion with the terms for alert (translation of terms and difference between PTWC and WCATWC products)
- More detail on impacts, injects
- Arrival times for all Forecast Points of CARIBE EWS, irrespective of impact.
- Webinars were considered useful for the organization of the exercise
- The emails that were sent with the products throughout the exercised were also very helpful
- Alternatives need to be identified at the local level for the reception and dissemination of messages
- Improvements could be made to the questionnaires for the final evaluation

- As 100% of the countries and territories indicated thru the survey, despite gaps in communications and actions, the exercise was **helpful in validating or highlighting the need for tsunami planning**. There is an **absolute need to reinforce preparedness, evacuation plans** and involvement of private sector in tsunami readiness. The fact that the **population and press has a high interest** and awareness on these matters is important.

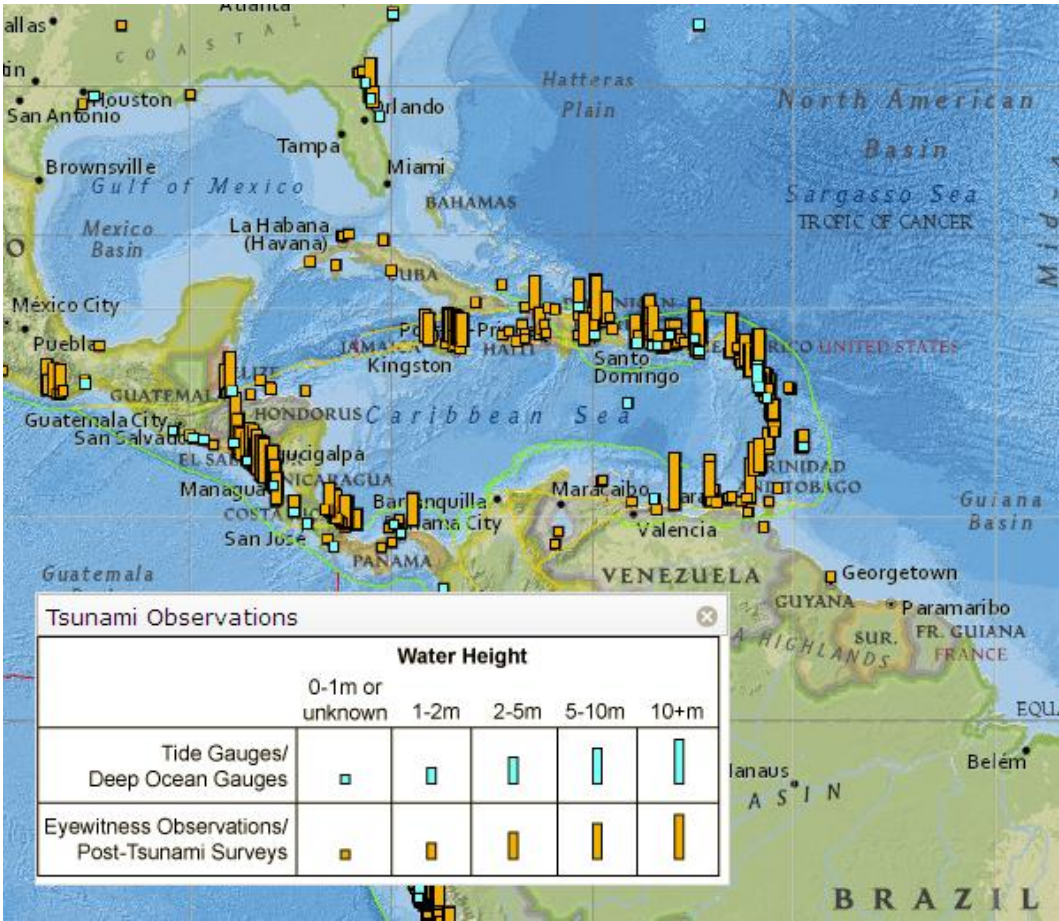


Other Reasons for the Conduct of the Exercise

- Success of LANTEX 09, 10, 11 and 12, every time the participation has increased and there is greater awareness
- Frequency of seismic and tsunami events at the global and regional levels, and the devastating impacts following the Haiti, Chile and Japan earthquakes and tsunamis;
- Tremendous vulnerability to life from tsunamis in the Region;
- Opportunities for partnerships with other bodies that coordinate and execute region-wide exercises;
- Importance of testing and refinement of warning systems and national protocols;



According to the historical tsunami data base, over the past 500 years, at least 75 tsunamis have been observed in the region, and although they do not occur as frequently as in other basins, the vulnerability is very large; upwards of 500,000 people could be killed within hours if the response is not adequate.



<http://ngdc.gov>

CARIBE WAVE/LANTEX 2013

Objectives

- **To exercise and evaluate operations of the current Tsunami Warning System and in particular, the CARIBE EWS.**
 - Validate the **issuance** of tsunami products from the PTWC and WCATWC.
 - Validate the **receipt and dissemination** of tsunami products by CARIBE EWS Tsunami Warning Focal Points (TWFP).
- **To begin a process of exposure to an initial test version of PTWC experimental products.**
 - Review and evaluate PTWC experimental products that will be available in parallel with existing PTWC products.
 - Provide feedback on the staging, format and content of the experimental products

Objectives (cont)

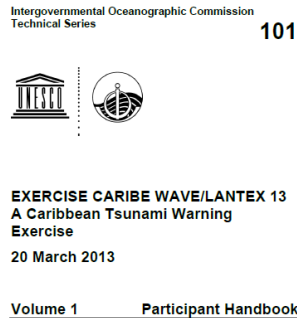
- **To validate the readiness to respond to a local/regional source tsunami.**
 - Validate the operational readiness of the Tsunami Warning Focal Point (TWFP, or like function) and/or the National Disaster Management Office (NDMO).
 - To improve operational readiness. Before the exercise, ensure appropriate tools and response plan(s) have been developed, including public education materials
 - Validate dissemination of warnings and information/advice by Tsunami Warning Focal Points to relevant in-country agencies and the public is accurate and timely.
 - Validate the organisational decision-making process (tsunami response plans) about public warnings and evacuations.
 - Validate the methods used to notify and instruct the public are accurate and timely.

Goals

- Participation of 85% of the Member States of ICG CARIBE EWS (75% participation in 2011)
- Compliance with the time line
- 75 % of the Member States involve community participation (61% had community involvement in 2011)
- 100% of focal points receive the dummy message thru one of the official means (90% received in 2011)
- 100% of countries submit exercise questionnaire (94% submitted in 2011)

Exercise Manual

- The exercise manual is available at www.caribewave.info
- It includes suggested actions as well as a description of the scenario, the time table, travel times and expected wave heights, figures and samples of the messages that would be issued for such an event and the website link to evaluation questionnaire.



Caribbean Tsunami Warning Program

The screenshot shows the main page for the CARIBE WAVE/LANTEX 2013 exercise. The title is 'CARIBE WAVE/LANTEX 2013' with the date 'March 20, 2013'. It describes the exercise as a Caribbean, Western Atlantic and Gulf of Mexico Tsunami Warning Exercise. A list of dates in Spanish and English is provided, along with registration information and links to various resources like the participant handbook and evaluation questionnaire.



Click map for status of any watch or warning for the Caribbean region.

A vertical sidebar on the right side of the page containing various links and services. It starts with a Facebook logo and the text 'Find us on Facebook'. Below this are sections for 'Notification Subscription Services', 'Carib. Sea Level Stations', 'Seismic Stations', 'Communications Systems', 'NOAA Tsunami Program', 'Preparedness', 'Education', 'CTWP Activities', and 'CTWP Office'. Each section lists specific services and links.

Scientific Background

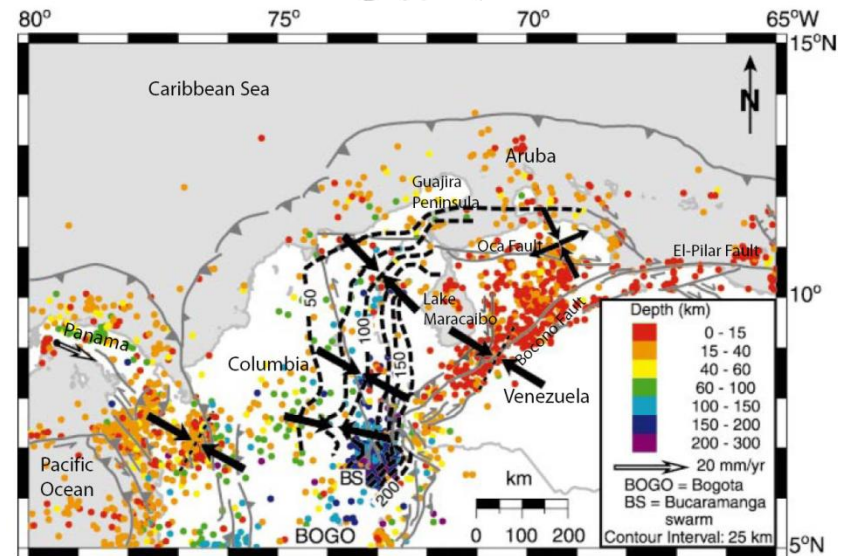
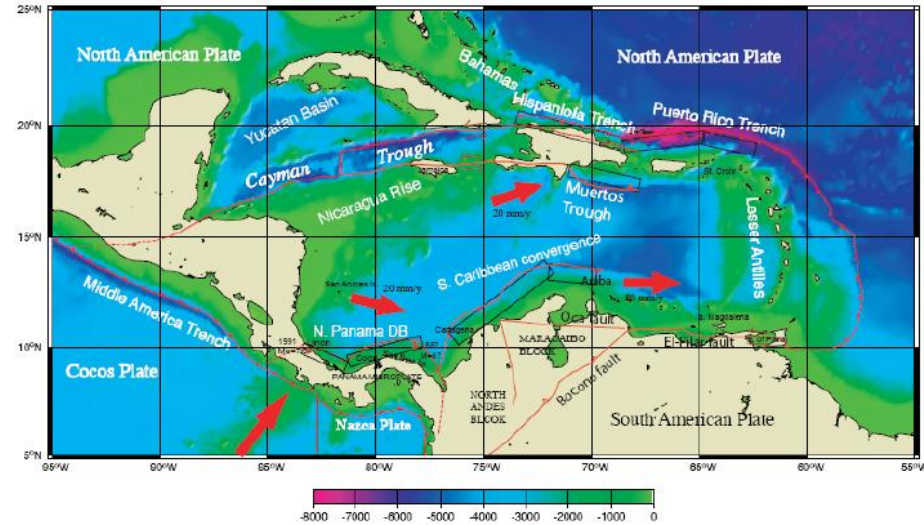
Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf Coasts: An Updated Report to the US Nuclear Regulatory Commission

By Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group

PI: Dr. Uri Ten Brink, USGS

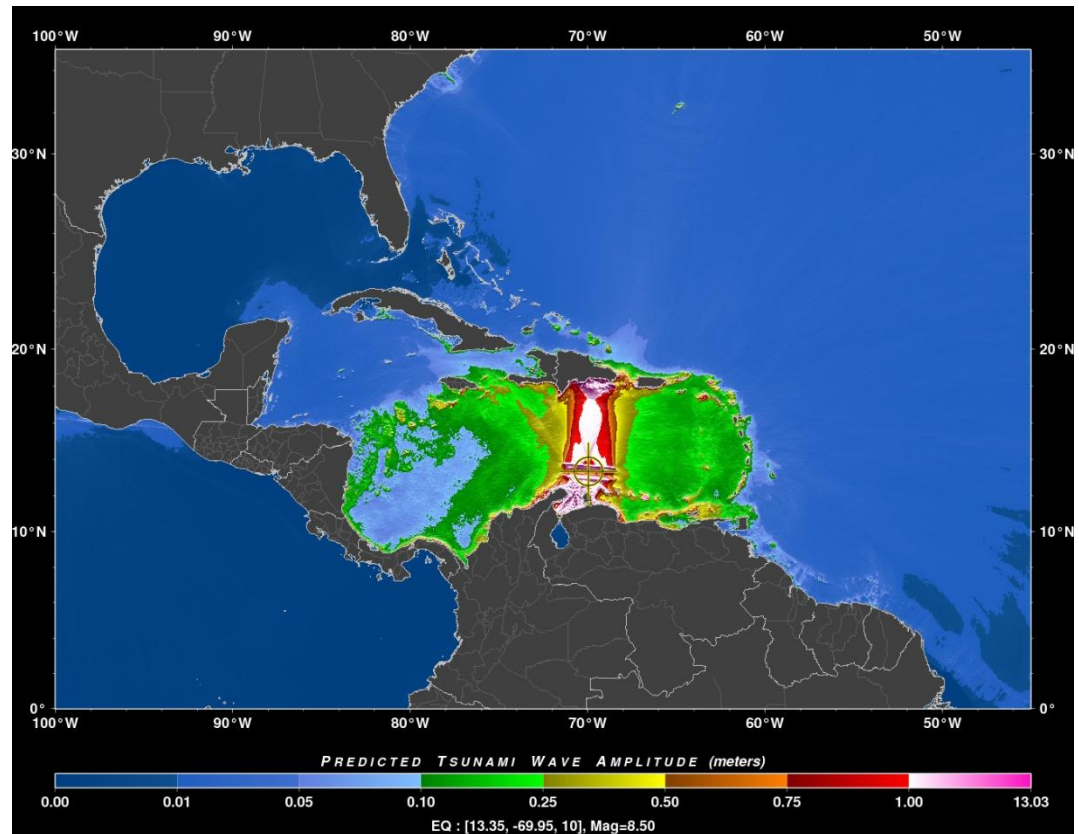
Year: 2007

Source: Northern South America Convergent Zone



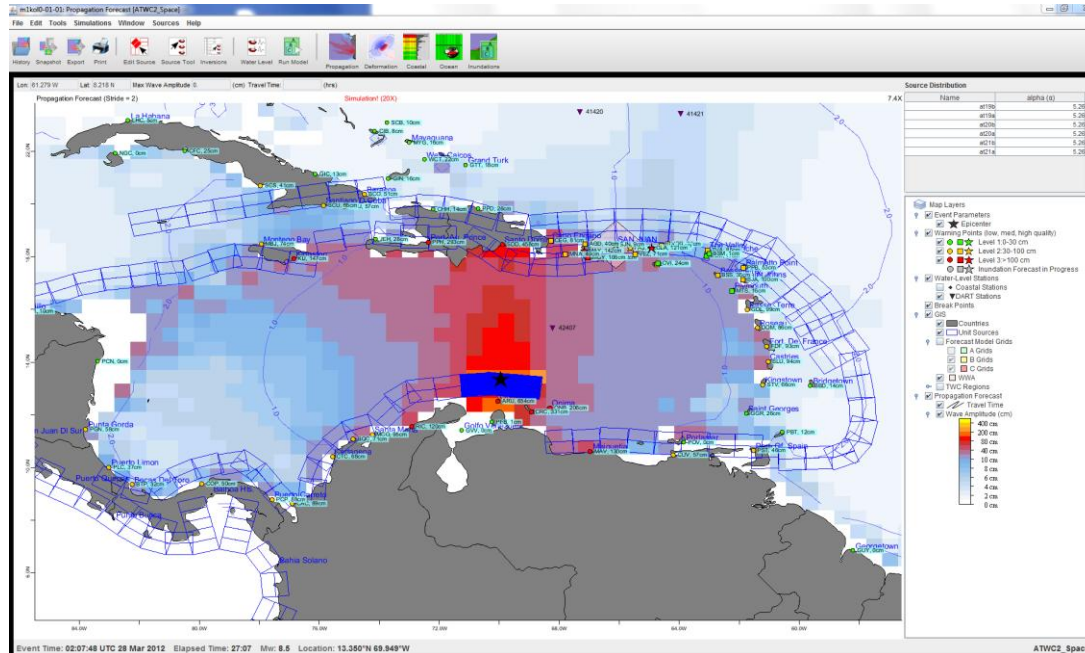
CARIBE WAVE 13

- March 20, 2013
- 13h00 UTC
- M 8.5 north of Aruba
- Kick off messages will be issued by PTWC and WCATWC. Other warning monitoring centers will also be issuing products.



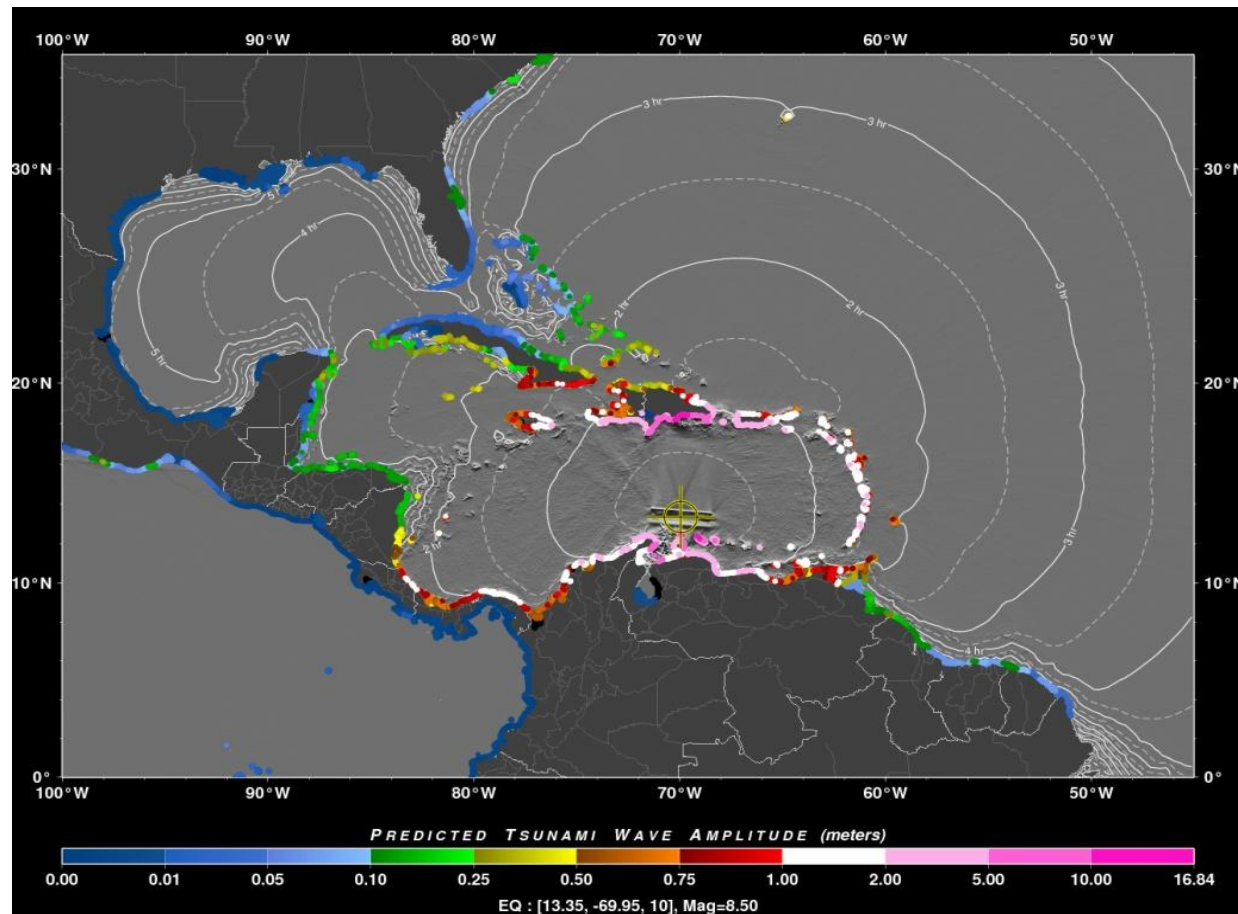
CARIBE WAVE LANTEX 2013

- The M 8.5 earthquake is to be located at 13.35N, 69.95W with a rupture area = 300 x 100 km, depth ~ 5-15 km (Figure 1). The evenly distributed slip is of 5.26 meters.



Short term inundation forecast graphic with the EQ source highlighted in blue (Kara Sterling, US NWS WCATWC).

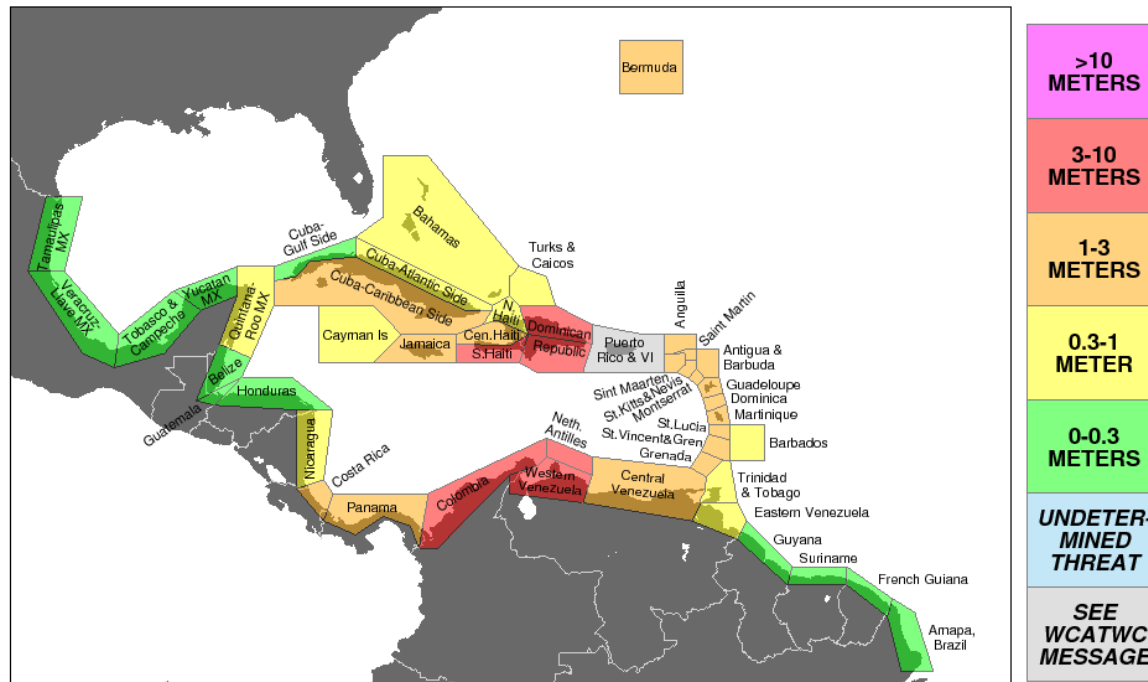
RIFT (Rapid Inundation Forecasting of Tsunamis) graphic with the travel times and coastal amplitude heights of the tsunamis (Charles McCreery, US NWS PTWC).



Opportunity to Evaluate New Products
these products will be available via web

www.caribewave.info

before the exercise, will not be sent out via email

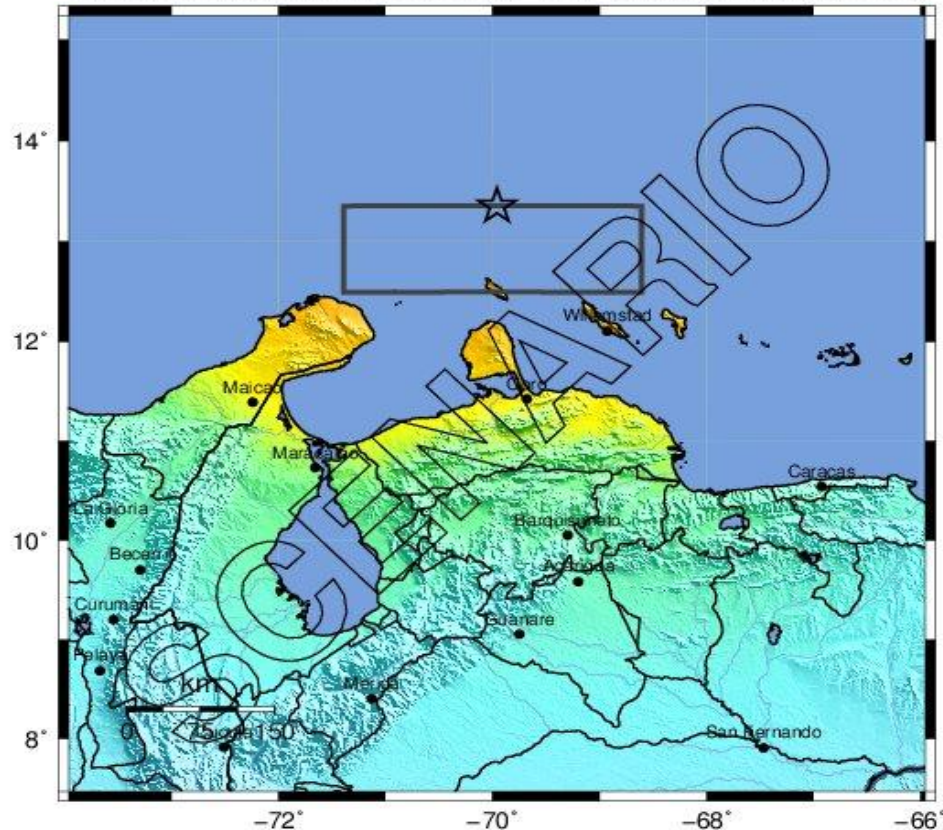


CARIBE EWS Proposed Forecast Polygons (Charles McCreery, US NWS PTWC).

USGS Scenario Shake Map

-- Earthquake Planning Scenario --
ShakeMap for Caribewave Scenario

Scenario Date: JAN 1 2013 12:00:00 AM GMT M 8.5 N13.35 W69.96 Depth: 10.0km



PLANNING SCENARIO ONLY -- Map Version 5 Processed Thu Jul 5, 2012 02:50:02 PM MDT

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al., 1999

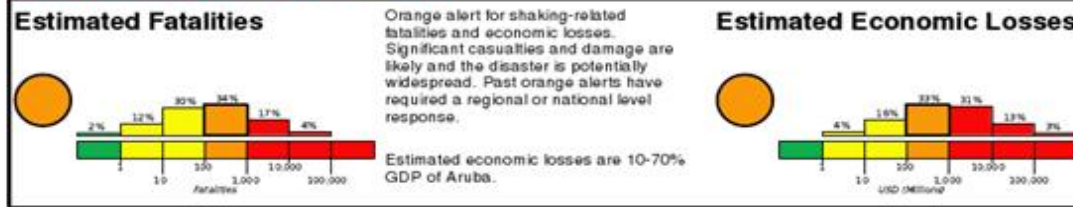
M 8.5, CaribeWave_se

Origin Time: Tue 2013-01-01 12:00:00 UTC (07:20:09 local)

Location: 13.35°N 69.96°W Depth: 10 km

FOR TSUNAMI INFORMATION, SEE: tsunami.gov

Created: 29 minutes, 0 seconds after earthquake

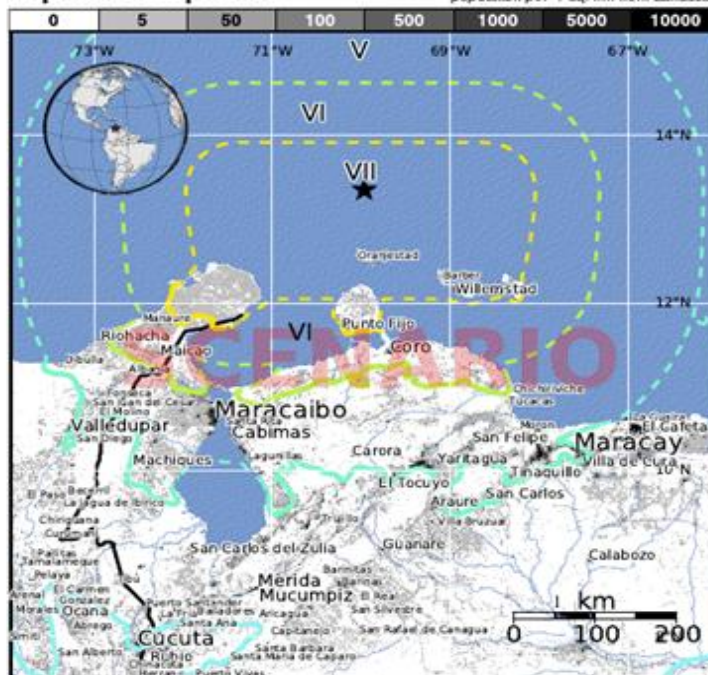


Estimated Population Exposed to Earthquake Shaking:

ESTIMATED POPULATION EXPOSURE (k = x1000)	--*	1,128k*	12,251k*	11,056k	817k	635k	16k	0	0	
ESTIMATED MODIFIED MERCALLI INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+	
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme	
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

*Estimated exposure only includes population within the map area

Population Exposure



Structures:

Overall, the population in this region resides in structures that are resistant to earthquake shaking, though some vulnerable structures exist. The predominant vulnerable building types are unreinforced brick masonry and adobe construction.

Historical Earthquakes (with MMI levels):

Date (UTC)	Dist. (km)	Mag.	Max Shaking MM(100)	Deaths
1989-04-30	317	5.9	VIII(190)	0
1976-02-15	379	5.7	VIII(1k)	0
1975-04-05	366	6.3	VIII(50k)	3

Selected City Exposure

from GeoNames.org

MMI City	Population
VIII Babijn	41k
VIII Willemstad	125k
VII Oranjestad	30k
VII Angochi	29k
VII Barber	2k
VII Dorp Soto	2k
V Maracaibo	2,225k
V Valencia	1,385k
V Barquisimeto	809k
V Maracay	1,754k
IV Caracas	3,000k

bold cities appear on map (k = x1000)

PAGER content is automatically generated, and only considers losses due to structural damage. Limitations of input data, shaking estimates, and loss models may add uncertainty.

Product Types Issued for Dummy Message with Transmission Methods

<u>Center</u>	<u>WMO ID</u>	<u>AWIPS ID</u>	<u>NWWS</u>	<u>AFTN</u>	<u>GTS</u>	<u>EMWIN</u>	<u>Fax</u>	<u>Email</u>
WCATWC	WEXX30 PAAQ	TSUATE	Yes	Yes	Yes	Yes	Yes	Yes
PTWC	WECA41 PHEB	TSUCAX	Yes	Yes	Yes	Yes	Yes	Yes

NWWS

NOAA Weather Wire Service

GTS

Global Telecommunications System

EMWIN

Emergency Manager's Weather Information Network

In the case of WCATWC the Dummy message will be issued with WMO ID WEXX30 PAAQ (instead of WEXX20 PAAQ) and AWIPS ID TSUATE (instead of TSUAT1).

Message Chronology

Date (UTC)	Time (UTC)	WCATWC Message				PTWC Message				
		#	Type	Dummy	Email	#	Type	Dummy	Email	
03/20/2013	1300		----- Earthquake Occurs -----							
03/20/2013	1302	01	Warn	Yes	Yes	01	Watch	Yes	Yes	
	1330					02	Watch	No	Yes	
03/20/2013	1337	02	Warn	No	Yes					
03/20/2013	1402	03	Warn	No	Yes					
	1420					03	Watch	No	Yes	
03/20/2013	1432	04	Warn	No	Yes					
03/20/2013	1502	05	Warn	No	Yes					
	1515					04	Watch	No	Yes	
03/20/2013	1604	06	Warn	No	Yes					
	1610					05	Watch	No	Yes	
03/20/2013	1704	07	Warn	No	Yes					
	1710					06	Watch	No	Yes	
03/20/2013	1803	08	Warn	No	Yes					
	1810					07	Watch	No	Yes	
03/20/2013	1902	09	Can	No	Yes					
	1910					08	Can	No	Yes	

Simulated tsunami messages that will be provided by PTWC and WC/ATWC:

- Warning
- Watch
- Advisory
- Cancellation



- West Coast/Alaska Tsunami Warning Center

- Caribbean Wide Tsunami Watch
- Cancellation



- Pacific Tsunami Warning Center

THE MESSAGES WILL BE ISSUED LIVE VIA EMAIL,
MUST REGISTER TO RECEIVE

Tsunami Messages

West Coast & Tsunami Warning Center
<http://www.nwr.noaa.gov>
Puerto Rico Seismic Network
<http://tudisimio.usps.edu> Telephone: 787-632-8632
TSUNAMI MESSAGES



- Danger!
- Run for high ground!
- Follow emergency instructions.

WARNING



ADVISORY

- Possible strong and dangerous local currents.
- Get out of the water and off the beach.
- Stay tuned for local emergency guidance.



- Potential danger.
- Stayed tuned for more information.

WATCH





- Relax.
- No danger.
- A distant ocean basin may be in danger.

INFORMATION STATEMENT

WEST COAST & ALASKA TSUNAMI WARNING CENTER

Pacific Tsunami Warning Center
<http://www.weather.gov/ptwc/index.php>
Caribbean Tsunami Warning Program
<http://www.srh.noaa.gov/srh/ctwp>
TSUNAMI MESSAGES FOR THE CARIBBEAN EXCEPT FOR PUERTO RICO AND THE US VIRGIN ISLANDS


- Danger for all coasts within the Caribbean Region!
- Run for High Ground!
- Follow the instructions of the emergency management officials.

CARIBBEAN SEA-WIDE TSUNAMI WATCH



- Danger for coasts within a thousand kilometers from Earthquake!
- Run for High Ground!
- Follow the instructions of the emergency management officials.

REGIONAL TSUNAMI WATCH



- Danger for coasts within a hundred kilometers from Earthquake!
- Run for High Ground!
- Follow the instructions of the emergency management officials.

LOCAL TSUNAMI WATCH



- Relax.
- No Danger.
- A more distant place may be in danger.

INFORMATION STATEMENT

Appendix D. TWC Dummy Messages

WCATWC

WEXX30 PAAQ 201302
TSUATE

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 20 2013

...CARIBE WAVE 13/LANTEX 13 TSUNAMI EXERCISE MESSAGE. REFER TO WCATWC MESSAGE 1
IN THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START THE CARIBE WAVE 13/LANTEX 13 CARIBBEAN
TSUNAMI EXERCISE. THIS WILL BE THE ONLY EXERCISE MESSAGE BROADCAST FROM THE
WEST COAST/ALASKA TSUNAMI WARNING CENTER EXCLUDING SPECIAL EMAIL MESSAGES
DISCUSSED IN THE HANDBOOK. THE HANDBOOK IS AVAILABLE AT THE WEB SITE
WCATWC.ARH.NOAA.GOV. THE EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A
REALISTIC SCENARIO TO TEST TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

\$\$

PTWC

WECR41 PHEB 201302
TSUCAX

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1302Z 20 MAR 2013

...CARIBE WAVE 13/LANTEX 13 TSUNAMI EXERCISE MESSAGE. REFER TO PTWC MESSAGE 1 IN
THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START THE CARIBE WAVE 13/LANTEX 13 CARIBBEAN
TSUNAMI EXERCISE. THIS WILL BE THE ONLY EXERCISE MESSAGE BROADCAST FROM THE
PACIFIC TSUNAMI WARNING CENTER EXCLUDING SPECIAL EMAIL MESSAGES DISCUSSED IN THE
HANDBOOK. THE HANDBOOK IS AVAILABLE AT THE WEB SITE WCATWC.ARH.NOAA.GOV. THE
EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A REALISTIC SCENARIO TO TEST
TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

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Appendix E. WCATWC Exercise Messages

The following messages, created for the CARIBE WAVE 13/LANTEX 13 tsunami exercise, are representative of the official standard products issued by the WCATWC during a large magnitude 8.5 earthquake and tsunami originating 57 miles north of Oranjestad, Aruba in the Caribbean Sea at 13.35°N, 69.95°W. During a real event, the TWCs would also issue graphical and html-based products to their web sites and via RSS. Forecasts are only provided for points where the WCATWC has high resolution digital elevation models. Observations are only provided for locations where there is a tide gauge to which the WCATWC has real time access.

WCATWC Message #1

WEXX30 PAAQ 201302
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 20 2013

...A TSUNAMI WARNING IS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

TSUNAMI WARNING IN EFFECT FOR...

- * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE 8.5
* ORIGIN TIME 0800 EDT MAR 20 2013
0900 AST MAR 20 2013
0900 CDT MAR 20 2013
1300 UTC MAR 20 2013
* COORDINATES 13.4 NORTH 70.0 WEST
* DEPTH 6 MILES / 10 KM
* LOCATION CARIBBEAN SEA

IMPACTS FOR TSUNAMI WARNING AREAS

- * A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
- * WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.

RECOMMENDED ACTIONS

- * IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- * BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- * DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- * DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS

INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED MAX TSUNAMI HEIGHT
* PUERTO RICO				
PENUELAS	0958 AST 03/20			
YABUCCA	1002 AST 03/20			
MAYAGUEZ	1011 AST 03/20			
SAN JUAN	1021 AST 03/20			
ESPERANZA	1029 AST 03/20			

* VIRGIN ISLANDS
LAMESHUR BAY 1011 AST 03/20
CHARLOTTE HX 1015 AST 03/20

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED TIDE

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

NEXT UPDATE AND ADDITIONAL INFORMATION

- * THIS MESSAGE WILL BE UPDATED IN 30 MINUTES.
- * REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- * CARIBBEAN COASTAL RESIDENTS OUTSIDE PUERTO RICO AND THE VIRGIN ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

##

WCATWC Message #2

WEXX30 PAAQ 201337
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 2
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
937 AM AST WED MAR 20 2013

NEW OBSERVATIONS AND FORECASTS ARE LISTED BELOW.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

TSUNAMI WARNING IN EFFECT FOR...

- * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

IMPACTS FOR TSUNAMI WARNING AREAS

P₂TWC Message #1

WECA41 FEB 201302
TSUCAK

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1302 UTC WED MAR 20 2013

THIS MESSAGE APPLIES TO COUNTRIES WITHIN AND BORDERING THE
CARIBBEAN SEA EXCEPT FOR PUERTO RICO AND THE VIRGIN ISLANDS.

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT.

A TSUNAMI WATCH IS IN EFFECT FOR

ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
COLOMBIA / SAINT KITTS / MONTERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME 08:33:05 20 MAR 2013
COORDINATES 8.3 NORTH 89.9 WEST
LOCATION CARIBBEAN SEA
MAGNITUDE 8.5

EVALUATION

EARTHQUAKES OF THIS SIZE HAVE THE POTENTIAL TO GENERATE A
WIDESPREAD DESTRUCTIVE TSUNAMI THAT CAN AFFECT COASTLINES ACROSS
THE ENTIRE CARIBBEAN REGION.

HOWEVER - IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS
WATCH IS BASED ONLY ON THE EARTHQUAKE EVALUATION. AUTHORITIES IN
THE REGION SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THE
POSSIBILITY OF A WIDESPREAD DESTRUCTIVE TSUNAMI.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS
WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL
ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE
LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN
SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N 68.9W	1326Z 20 MAR
COLOMBIA	SANTA MARTA	11.2N 74.2W	1327Z 20 MAR
	RIOHACHA	11.6N 72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N 74.9W	1350Z 20 MAR
	CARTAGENA	10.4N 75.6W	1352Z 20 MAR
	PUNTA CARIBANA	8.6N 76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N 67.0W	1329Z 20 MAR

	CUMANA	10.5N 64.2W	1423Z 20 MAR
	PUNTO FIJO	11.7N 70.2W	1522Z 20 MAR
	GOLFO VENEZUELA	11.4N 71.2W	1635Z 20 MAR
	FORLAMAR	10.9N 63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO DOMINGO	18.5N 69.9W	1350Z 20 MAR
	CABO ENGANO	18.6N 68.3W	1356Z 20 MAR
	PUERTO PLATA	19.8N 70.7W	1433Z 20 MAR
MONTERRAT	PLYMOUTH	16.7N 62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N 61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1405Z 20 MAR
HAITI	JEREMIE	16.6N 74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N 72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N 72.4W	1507Z 20 MAR
GRENADA	SAINT GEORGES	12.0N 61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N 61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N 62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N 75.8W	1413Z 20 MAR
	BARCOA	20.4N 74.5W	1429Z 20 MAR
	GIBARA	21.1N 76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N 80.5W	1504Z 20 MAR
	LA HABANA	23.2N 82.4W	1614Z 20 MAR
	SANTA CRZ D SUR	20.7N 78.0W	1781Z 20 MAR
	NUEVA GERONA	21.9N 82.8W	1834Z 20 MAR
SAINT MARTEN	SIMPSON_BAAT	18.0N 69.1N	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.5N 61.0W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N 60.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.5N 76.9W	1419Z 20 MAR
	MONTEGO BAY	18.5N 77.9W	1423Z 20 MAR
ANGUILLA	THE VALLEY	18.3N 63.1W	1419Z 20 MAR
PANAMA	PUERTO CARRETO	8.8N 77.6W	1424Z 20 MAR
	ALIGANDI	9.2N 78.0W	1426Z 20 MAR
	PUERTO OBALDIA	8.7N 77.4W	1427Z 20 MAR
	COLON	9.4N 79.9W	1435Z 20 MAR
	BOCAS DEL TORO	9.4N 82.2W	1501Z 20 MAR
ANTIGUA	SAINT JOHNS	17.1N 61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N 59.6W	1431Z 20 MAR
BARBUDA	PALMETTO POINT	17.6N 61.9W	1432Z 20 MAR
BAHAMAS	GREAT INAGUA	20.9N 73.7W	1434Z 20 MAR
	MAYAGUANA	22.2N 73.0W	1447Z 20 MAR
	LONG IS	23.2N 73.1W	1505Z 20 MAR
	CROOKED IS	23.7N 74.1W	1509Z 20 MAR
	SAN SALVADOR	24.1N 74.5W	1513Z 20 MAR
	ELEUTHERA IS	25.2N 76.1W	1524Z 20 MAR
	EXUMA	23.6N 75.9W	1525Z 20 MAR
	CAT IS	24.4N 75.5W	1525Z 20 MAR
	NASSAU	25.1N 77.4W	1537Z 20 MAR
	ANDROS IS	25.0N 77.9W	1540Z 20 MAR
	FREEPORT	26.5N 78.8W	1558Z 20 MAR
	ABACO IS	26.6N 77.1W	1612Z 20 MAR
	BIMINI	25.8N 79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND TURK	21.5N 71.1W	1439Z 20 MAR
	WEST CAICOS	21.7N 72.3W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN ISLANDS	19.2N 79.8W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N 60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N 61.5W	1620Z 20 MAR
COSTA RICA	PUERTO LIMON	10.0N 83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN ISLANDS	19.3N 81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE BLANCHE	18.3N 62.0W	1459Z 20 MAR
NICARAGUA	PUNTA GORDA	11.4N 83.8W	1541Z 20 MAR
	PUERTO CABEZAS	14.0N 83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N 64.6W	1551Z 20 MAR

Cont. PTWC

MEXICO	COZUMEL	20.5N	87.0W	1555Z	20	MAR
	VERACRUZ	19.2N	96.1W	1839Z	20	MAR
	MADERO	22.3N	97.8W	1845Z	20	MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z	20	MAR
	CAMPECHE	19.9N	90.5W	2221Z	20	MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z	20	MAR
	TRUJILLO	15.9N	86.0W	1626Z	20	MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z	20	MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z	20	MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1848Z	20	MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z	20	MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z	20	MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z	20	MAR
	SAO_LUIS	2.5S	44.3W	2121Z	20	MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z	20	MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.



WCATWC Message #9

WEXX30 PAAQ 201902
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 9
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
302 PM AST WED MAR 20 2013

...THE TSUNAMI WARNING IS CANCELLED...

CANCELLATIONS

* COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

IMPACTS - UPDATED

- * TSUNAMI ACTIVITY HAS SUBSIDED ALONG THE COASTS OF PUERTO RICO, VIRGIN ISLANDS... AND U.S. AND CANADIAN COASTS IN THE ATLANTIC.
- * ONGOING ACTIVITY MAY PERSIST IN SOME AREAS CAUSING STRONG CURRENTS DANGEROUS TO SWIMMERS AND BOATS.
- * THE DETERMINATION TO RE-OCCUPY HAZARD ZONES MUST BE MADE BY LOCAL OFFICIALS.

RECOMMENDED ACTIONS - UPDATED

- * DO NOT RE-OCCUPY HAZARD ZONES UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
PENUELAS PUERTO RICO	1035 AST 03/20	03.8FT
YABUCCA PUERTO RICO	1045 AST 03/20	02.8FT
MAYAGUEZ PUERTO RICO	1115 AST 03/20	02.1FT
SAN JUAN PUERTO RICO	1105 AST 03/20	01.1FT
ESPERANZA VIEQUES IS. PR	1105 AST 03/20	01.8FT
LAMESHUR BAY USVI	1057 AST 03/20	01.8FT
CHARLOTTE NN USVI	1015 AST 03/20	03.1FT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
PUNTA CANA DR	1003 AST 03/20	01.8FT
ROSEAU DOMINICA	1018 AST 03/20	00.8FT
BARAHONA DR	1027 AST 03/20	07.7FT
CAP HAITIEN HT	1146 AST 03/20	00.4FT
DESIRADE GUADELOUPE	1208 AST 03/20	00.6FT

OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

NEXT UPDATE AND ADDITIONAL INFORMATION

- * THIS WILL BE THE LAST WEST COAST/ALASKA TSUNAMI WARNING CENTER BULLETIN ISSUED FOR THIS EVENT.
- * REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE

INFORMATION

- * CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION AT PTWC.WEATHER.GOV.

PTWC Message #8

WECA41 PHEB 201910
TSUCAK

TSUNAMI MESSAGE NUMBER 8
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1910 UTC WED MAR 20 2013

THIS MESSAGE APPLIES TO COUNTRIES WITHIN AND BORDERING THE
CARIBBEAN SEA EXCEPT FOR SURINAM, GUYANA, THE VIRGIN ISLANDS,

... THE TSUNAMI WATCH IS CANCELLED.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME 1305Z 20 MAR 2013
COORDINATES 11.3 NORTH 69.9 WEST
LOCATION CARIBBEAN SEA
MAGNITUDE 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

Gauge Location	LAT	LOX	TIME	AMPL	PER
DART 42407	18.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN
MONA ISLAND PR	18.1N	67.8W	1352Z	3.77M / 12.2FT	18MIN
PENUELAS PR	18.0N	66.8W	1352Z	1.11M / 3.6FT	16MIN
WILLEMSTAD CURACAO	18.0N	68.2W	1352Z	3.44M / 11.2FT	20MIN
PUNTA CANA DO	18.0N	69.4W	1402Z	4.50M / 14.8FT	20MIN
BARAHONA DO	18.0N	69.2W	1407Z	6.15M / 20.0FT	18MIN
LIMETREE VI	18.0N	69.2W	1412Z	1.41M / 4.6FT	16MIN
YABUCCA PR	18.0N	68.8W	1412Z	0.86M / 2.8FT	22MIN
MAYAGUEZ PR	18.0N	67.2W	1412Z	0.65M / 2.1FT	12MIN
ST CROIX VI	17.7N	64.2W	1417Z	0.84M / 2.7FT	18MIN
MAGUEYES ISLAND PR	18.0N	67.2W	1412Z	2.56M / 8.3FT	24MIN
ESPERANZA VIEQUES PR	18.1N	65.5W	1420Z	0.06M / 1.9FT	16MIN
AGUADILLA PR	18.5N	67.2W	1420Z	1.92M / 6.3FT	19MIN
ARECIBO PR	18.3N	66.7W	1422Z	1.43M / 4.7FT	22MIN
PORT SAN ANDRES DO	18.4N	68.6W	1427Z	13.54M / 44.0FT	14MIN
ROSEAU DM	15.3N	61.4W	1432Z	1.10M / 3.6FT	18MIN
SAN JUAN PR	18.0N	68.2W	1432Z	0.34M / 1.1FT	14MIN
FRICKLEY BAY GD	18.0N	68.2W	1442Z	1.29M / 4.2FT	20MIN
BARBUDA AG	17.9N	61.8W	1450Z	0.21M / 0.7FT	22MIN
PUERTO PLATA DO	19.8N	70.7W	1450Z	0.49M / 1.6FT	22MIN
LAMESHURRAYS, JOHNSVILLE	18.3N	64.7W	1450Z	0.58M / 1.9FT	17MIN
CHARLOTTE-AMALIE VI	18.3N	64.5W	1452Z	0.95M / 3.1FT	24MIN
DESRADE GUYANA	16.3N	61.1W	1457Z	0.18M / 0.6FT	24MIN
CULEBRA IS PR	18.0N	65.3W	1452Z	1.38M / 4.5FT	20MIN
CAP HAITIEN HT	18.0N	68.2W	1512Z	0.14M / 0.5FT	23MIN
FAJARDO PR	18.3N	65.6W	1512Z	1.21M / 3.9FT	22MIN
LIMON CR	10.0N	83.0W	1530Z	0.74M / 2.4FT	26MIN

LAT... LATITUDE (N-NORTH, S-SOUTH)

LOX... LONGITUDE (E-EAST, W-WEST)

TIME... TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)

AMPL... TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CORRECTED THROUGH WAVE HEIGHT
VALUES ARE GIVEN IN BOTH METERS (M) AND FEET (FT).

PER... PERIOD OF TIME IN MINUTES (MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY

ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

A SIGNIFICANT TSUNAMI WAS GENERATED BY THIS EARTHQUAKE.
SEA LEVEL READINGS NOW INDICATE THAT THE THREAT IS DIMINISHING
IN MOST AREAS. THEREFORE THE TSUNAMI WATCH ISSUED BY THIS CENTER
IS NOW CANCELLED.

FOR ANY AFFECTED AREAS - WHEN NO MAJOR WAVES HAVE OCCURRED FOR AT
LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME OR DAMAGING WAVES
HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES
CAN ASSUME THE THREAT IS PASSES. DANGER TO BOATS AND COASTAL
STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS.
AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE
ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL
AUTHITIES.

THIS WILL BE THE FINAL PRODUCT ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT UNLESS ADDITIONAL INFORMATION
BECOMES AVAILABLE.

Member State Participation

- Member States to establish their own national task teams to determine the scope of their national participation and testing;



Media Arrangements

- PRSN Tsunami Media Guide (<http://www.prsn.uprm.edu/mediakit/>)
- Seismic Research Unit Tsunami and other Coastal Hazards WS Media Information Kit (<http://www.uwiseismic.com>).
- Sample press release in Handbook which can be adapted as necessary.
- NOAA and UNESCO will be issuing press releases in advance of the event

Actions in Case of a Real Event

- In the case of a real event occurring during the exercise, the TWCs will issue their normal messages for the event. Such messages will be given full priority and a decision will be made by the TWCs whether to issue the dummy message and to send email messages to registered recipients. Smaller earthquakes that only trigger a Tsunami Information Statement will not disrupt the exercise. All documentation and correspondence relating to this exercise is to be clearly identified as “**CARIBE WAVE 13/LANTEX 13**” and “**Exercise.**”

Procedure for False Alarm

- Any time disaster response exercises are conducted, the potential exists for the public or media to interpret the event as real. Procedures should be set up by all participating entities to address public or media concerns involving this exercise in case of mis-interpretation by media or the public.

Post-Exercise Evaluation

- The CaribeWave/Lantex 2013 Evaluation Form to be filled out and submitted by **April 1, 2013** by the officially designated national/state and territorial authorities can be found at:
https://www.surveymonkey.com/s/caribewave13_eval

Evaluation Form

To be completed by individuals and agencies/Only 1 Report to be submitted by each
Tsunami National Contact

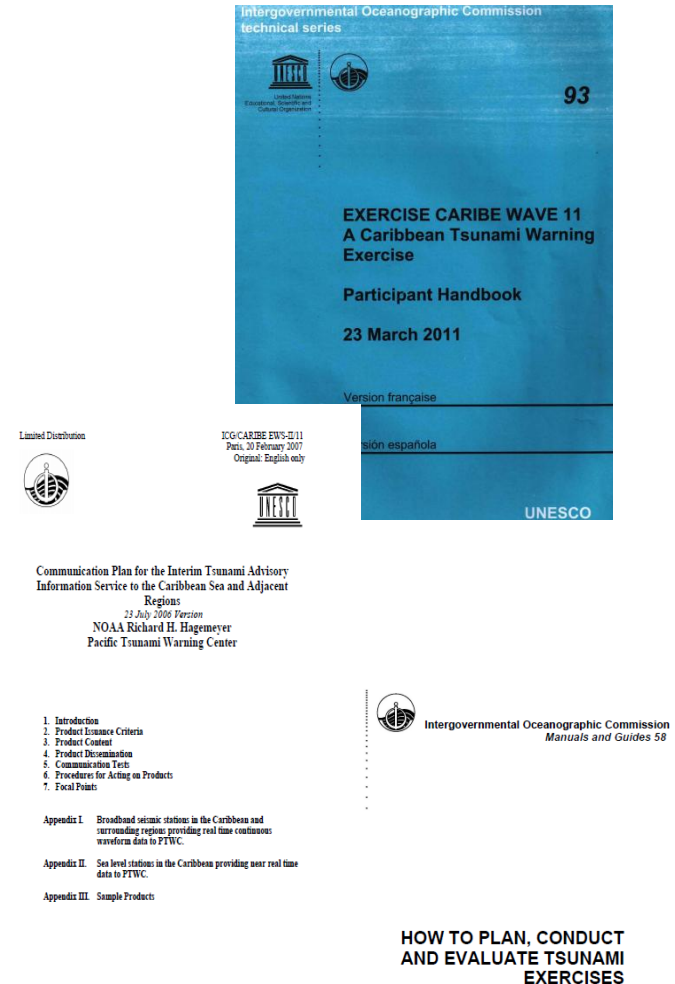
Exercise CARIBE WAVE/LANTEX 13 Evaluation Form			
Contact Details			
Agency:		Country/State/Territory:	
Contact Name:		Contact Position:	
Contact Phone:		Contact Mobile:	
Contact E-Mail:			

		Yes	No	Comment	Not applicable	
0A	Are you filling out this evaluation as the Tsunami National Contact or Designated Agency? If No, only answer Section 5.	<input type="checkbox"/>	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> C	<input type="checkbox"/> NA

		Yes	No	Comment	Not applicable	
0B	Did your country participate in CARIBE WAVE/LANTEX 13? If not, only answer sections 2 and 3 A and B.	<input type="checkbox"/>	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> C	<input type="checkbox"/> NA

Resources

- Draft IOC Manual “How to plan, conduct and evaluate tsunami exercises” which will also be a useful resource (English and Spanish).
- CARIBE WAVE 2011 Manual
- CARIBE WAVE 2011 Report (Draft)
- PTWC Communications Plan for the Caribbean



DRAFT

UNESCO

CARIBE WAVE LANTEX 2013 Task Team

- Chair of CARIBE EWS-Christa von Hillebrandt
- Chairs of Working Group 1, 2, 3 and 4-Emilio Talavera, Narcisse Zahibo, Liz Klute and Kerry Hinds.
- Manager Caribbean Tsunami Warning Program (Leader)-Christa von Hillebrandt
- Director of Caribbean Tsunami Information Center
- Director ITIC-Laura Kong
- Director Pacific Tsunami Warning Center-Charles McCreery
- Director West Coast/Alaska Tsunami Warning Center-Paul Whitmore
- Director of CDEMA
- Director of CEPREDENAC-delegated to Wilfred Strauch
- Technical Secretary ICG CARIBE EWS-Bernardo Aliaga

Additional Info

- Additional materials will be added to CTWP and PRSN websites.
- Send links of other national pages to christa.vonh@noaa.gov to include on CTWP and PRSN websites
- This presentation is available on CTWP website

The screenshot displays the Lantex website interface. At the top, the Lantex logo is on the left, and the text 'Red Sismica de Puerto Rico Servicio Lantex 1.0' and 'Fecha de evento: 25 de Marzo de 2012' is on the right. A 'Select Language' dropdown menu is also present. Below the header, there are navigation tabs for 'Home', 'Mapas', 'Documentos', 'Manuales', and 'Enlaces'. The main content area is divided into several sections. On the left, there is a 'Temas de Importancia' section with a list of topics including 'Objetivos', 'Tipos de ejercicios', 'Sistema General de Ejercicio', 'Emergency Alert System (EAS)', 'Comunicado de Prensa', 'Problema Crítico de Gobernador', 'Suscribirse a nuestras listas de servicio', and 'Ejercicios Anteriores'. Below this is a 'Niveles de Mensajería de Tsunami' section with a graphic showing different levels of communication. The central part of the page features two columns: 'Terremotos' with a sub-section 'Terremotos / Earthquakes' and a graphic of seismic waves, and 'Tsunamis' with a sub-section 'Tsunamis' and a graphic of a tsunami wave. Below these are sections for '¿Quiénes pueden participar?' and '¿Cómo participar?'. The '¿Quiénes pueden participar?' section lists five categories: 1. Tsunami Warning Focus Points, 2. Agencias Salariales y Federales, 3. Comunicados locales (en especial los Municipios TsunamiReady), 4. Empresas Privadas, and 5. Escuelas Públicas y Privadas. The '¿Cómo participar?' section lists three steps: 1. Realizando una de las 5 tipos de ejercicios, 2. Realizando al menos una de las pruebas de comunicaciones, and 3. Completar las Evaluaciones de Ejercicio. Below these sections, there are three columns of smaller images and text, each with a question: '¿Por qué deben participar los Municipios TsunamiReady?', '¿Por qué deben participar las zonas A2/M2-A3, A2/M2-A4 y CMWEV?', and '¿Por qué deben participar las Escuelas?'. The bottom of the page features a row of logos for various organizations, including NOAA, FEMA, and others. At the very bottom, there is a copyright notice: 'Copyright 2012 Red Sismica de Puerto Rico'.

Webinars

- ✓ [24 de enero en español](#)
- ✓ [25 January in English](#)
- [14 de febrero en español](#) (originally Feb. 12)
- [15 February in English](#) (originally Feb. 13)

Questions, Comments

Thank you for participating

Timeline

Action	Due Date
1st Draft Circulated among Task Team	July 1, 2012
2 nd Draft Circulated among ICG CARIBE EWS TNC/TWFP	September 1, 2012
Final Exercise Manual Available on Line	November 1, 2012
Circular Letter Issued by IOC	November 15, 2012
1st Webinar	Mid- Late January, 2013
2 nd Webinar	Mid – Late February 2013
Exercise	March 20, 2013
Exercise Questionnaire Due	April 1, 2013
Report	ICG CARIBE EWS VIII